Apollo VP3/AT PCIset

EP-58VP3A

ISA/PCI/AGP MainBoard

with Onboard PCI IDE and Super Multi-I/O.

TRADEMARK

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The specification is subject to change without notice.

V012

Package Checklist

Please check your package which should include all items listed below.
If you find any item damaged or missed, please contact your supplier.

- One mainboard
- One manual
- One IDE ribbon cable
- One floppy ribbon cable
- One Parallel port ribbon cable
- One Serial port ribbon cable(COM1,COM2)
- One AGP driver diskette
- One Ultra_DMA IDE driver diskette

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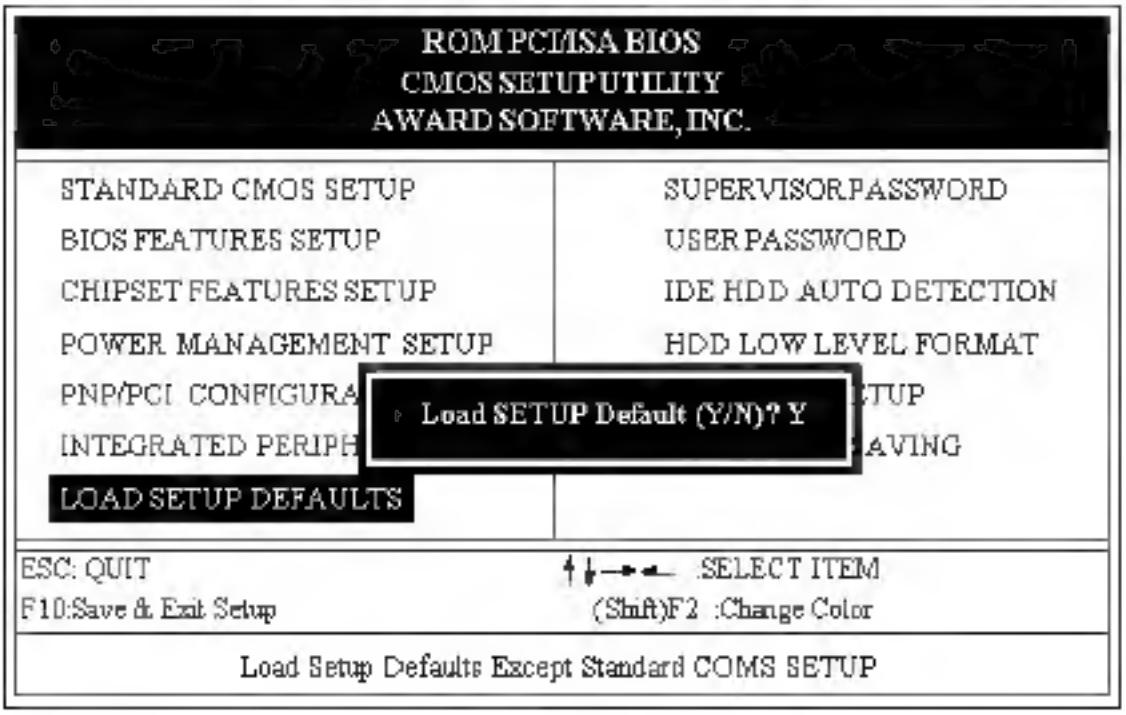
NOTE :

The "**LOAD SETUP DEFAULTS**" function loads the system default data directly from ROM and initializes the associated hardware properly. This function is necessary when you accept this mainboard, or the system CMOS data will corrupt.



LOAD SETUP DEFAULT

Chapter 1
Introduction

The EP-58VP3A mainboard is a high performance system hardware based on Intel Pentium processor and is equipped with an AGP slot, three PCI slots, three standard ISA slots, Super Multi-I/O controller and dual port PCI-IDE connectors for the future expansion. The hardware dimension is 220mm x 230mm with a four-layer-design technology.

Specification

- VIA Apollo VP3 AGP/PCIset chipset.
- Intel **Pentium®** Processor, Pentium Processor with MMX Technology, AMD K5/K6, Cyrix 6x86L/6x86MX & *idt* C6 operating at ***90 ~ 333 MHz*** with **321 ZIF socket** 7 provides scalability to accept faster Processors in the future.
- Supports up to ***320*** MegaBytes of memory (168-Pin DIMM x 2, 72-Pin SIMM x 2).
- Supports 512KB (Pipelined Burst SRAM) L2 **Cache**.
- Supports three 16 bit ISA slots ,three 32 bit PCI slots, ***an AGP slot*** and provides two independent high performance PCI IDE interfaces capable of supporting **PIO Mode 3/4 and *Ultra-DMA33*** devices.
- Supports **ATAPI** (e.g. **CD-ROM**) devices on both IDE interfaces.
- Supports a floppy port, a parallel port (EPP,ECP port), two serial ports (16550 Fast UART compatible), 1 USB Connector, a PS/2-style mouse connecter and an AT style keyboard connector.
- Supports Award Plug & Play BIOS.
- Supports CPU Hardware sleep, APM (Advanced Power Management) and ***ACPI*** *(Advanced Configuration Power Interface).*
- Supports *Switching Regulator* for CPU power supply, and ***single jumper*** *for CPU working voltage selection.*
- *Supports* ***Dip switch*** *for CPU selection.*

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Chapter 2
Hardware design

2-1 Mainboard Layout

The EP-S8VP3A is designed with VIA Apollo VP3 AGP/PCIset chipset which is developed by VIA Corporation to fully support Pentium® Processor PCI/ISA system. By providing a massive increase in the bandwidth available between the video card and the processor (66MHz), the unique feature of AGP supported by VIA Apollo VP3 chipset improves the speed of rendering and texturing for 3D graphics.The chipset also provides an integrated IDE controller with two high performance IDE interfaces for up to four IDE devices (hard devices, CD-ROM device, etc). The Winbond W83877TF Super I/O controller provides the standard PC I/O function: one floppy interface, two 16 Byte FIFO serial ports and one EPP/ECP capable parallel port. The **EP-S8VP3A** layout is shown in the next page for user's reference. **Care must be taken** when inserting memory modules, CPUs or even plugging PCI card into associated slots to avoid damaging any circuits or sockets on board. A cooling fan is strongly recommended when installing Pentium/Pentium MMX/K5/K6/6x86L/ 6x86MX processor due to possible overheat.

The EP-S8VP3A supports a minimum of 8MB and a maximum of 320MB of System Memory while Onboard 512KB cache to increase system performance.

The EP-S8VP3A supports standard Fast Page, EDO (Extended Data Out or Hyper Page Mode) or synchronous DRAM. **The EP-S8VP3A** provides two 168-pin DIMM sites and two 72-pin SIMM sites for memory expansion. The sockets support 1Mx64(8MB), 2Mx 64(16MB), 4Mx 64(32MB), and 8Mx 64(64MB) single-sided or double-sided memory modules. The memory timing requires 70 ns Fast page devices or 60 ns EDO DRAM. (DRAM Modules may be parity [x 36] or non-parity [x 32].

The EP-S8VP3A supports **two Onboard PCI IDE** connectors, and automatically detects IDE harddisk type by BIOS utility automatic.

The EP-S8VP3A supports Award Plug & Play BIOS for the ISA and PCI cards. The BIOS can be located in Flash EPROM which can replace BIOS code easily if necessary.

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EP-58VP3A Layout

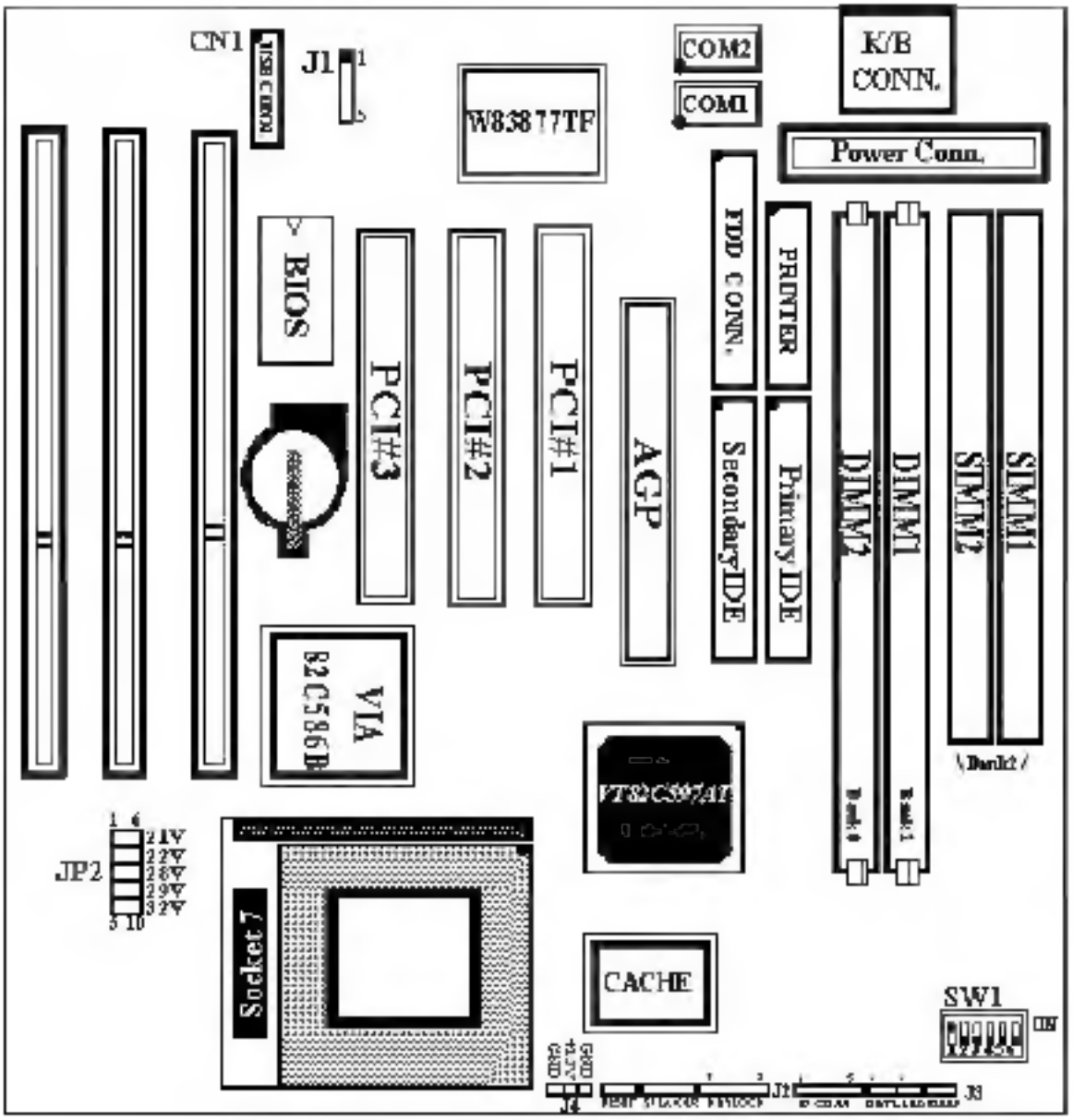

Figure 2-1

Note : SW1 setting

ON : Means ON

ON : Means OFF

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2-2 Connectors and Jumpers

This section describes the connectors, jumpers and switch equipped in the mainboard. Please refer to **Figure 2-1** for the location of each connector and jumper.

SW1 : CPU Selection						Pentium PentiumMMX AMD K5 K6	Bus Frequency x Multiplier	Cyrix & IBM 6x86(L) / 6x86MX
1	2	3	4	5	6			
OFF	OFF	OFF	ON	OFF	OFF	90MHz	60MHz x 1.5	
			OFF	OFF	OFF	100MHz	66MHz x 1.5	
ON	OFF	OFF	ON	OFF	OFF	120MHz	60MHz x 2	6x86/L-PR150
			OFF	OFF	OFF	133MHz	66MHz x 2	6x86/L/MX-PR166
			OFF	ON	OFF		75MHz x 2	6x86/L/MX-PR200
ON	ON	OFF	ON	OFF	OFF	150MHz	60MHz x 2.5	6x86MX-PR166
			OFF	OFF	OFF	166MHz	66MHz x 2.5	6x86MX-PR200
			OFF	ON	OFF	188MHz	75MHz x 2.5	6x86MX-PR233
OFF	ON	OFF	ON	OFF	OFF	180MHz	60MHz x 3	
			OFF	OFF	OFF	200MHz	66MHz x 3	6x86MX-PR233 *
			OFF	ON	OFF	225MHz	75MHz x 3	6x86MX-PR266 *
OFF	OFF	OFF	OFF	OFF	OFF	233MHz	66MHz x 3.5	6x86MX-PR266 *
ON	OFF	ON				266MHz *	66MHz x 4	
ON	ON	ON				300MHz *	66MHz x 4.5	
OFF	ON	ON				333MHz *	66MHz x 5	

* *These settings are reserved for the future CPUs versions. When the future CPUs are ready and suitable for this mainboard, these settings will be correctly updated.*

JP2 : CPU Vcore voltage selection; For Pentium Processor with MMX technology, AMD K6 and Cyrix 6x86L/6x86MX

1-6 : 2.1V Reserved
2-7 : 2.2V Reserved for AMD K6 CPUs in the future
3-8 : 2.8V for Pentium MMX and Cyrix 6x86L
4-9 : 2.9V for AMD K6-PR2-166/200MHz and Cyrix 6x86MX
5-10 : 3.2V for AMD K6-PR2-233/266MHz

Note : JP2 is for Vcore Settings of dual voltage CPUs. Please ignore the settings of single voltage CPUs. Such as Intel Pentium Processor, AMD K5, Cyrix M1 and idt C6 here.

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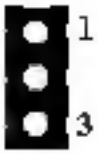
J4



The Power Supply (+12V) of the CPU Cooling FAN
1.GND
2.+12V
3.GND

J2

Reset Switch - Closed to restart system.

Speaker - connect to the system's speaker for beeping.
1.Speaker
2.N/C
3.GND
4.GND

KeyLock - Keyboard lock switch & Power LED connector
1.Power LED(+)
2.N/C
3.GND
4.Keylock
5.GND

J3

IrDA/ASK IR CONNECTOR
1.VCC
2.NC
3.IRRX
4.GND
5.IRTX

IDE LED indicator - LED ON when harddisks activate.

Turbo LED indicator - LED ON when higher speed is selected.
There is no deturbo function so that the turbo LED is always ON

Sleep/Resume switch - Push the button to enter the sleep mode.

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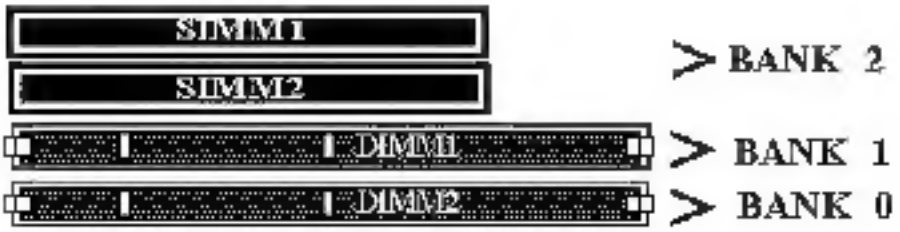
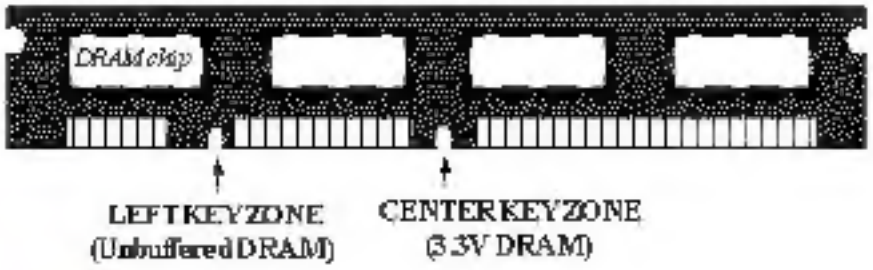
2-3 System Memory Configuration

The EP-58VP3A supports different type of settings for the system memory. The following figures and table provides all possible memory combinations.



SIMM 1 & 2 BANK 2	DIMM1 BANK 1	DIMM2 BANK 0	TOTAL MEMORY
8MB 16MB 32MB x2	8MB 16MB 32MB 64MB 128MB x1	8MB 16MB 32MB 64MB 128MB x1	MAX=320MB

NOTE 1 : The KEY ZOOM of the DIMM socket is 3.3V/Unbuffered.



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2-4 Integrated PCI Bridge

The **EP-58VP3A** utilizes **VIA Apollo VP3 PCIset** chipset to support Intel Pentium Processor PCI/ISA system. The VIA Apollo VP3 PCIset chipset consists of the 82C597AT system controller (TSC), and one 82C586B PCI ISA/IDE Accelerator bridge chip. It provides an interface which translates CPU cycle into PCI bus cycle and PCI burst read/write capability. In addition, it provides high performance PCI arbitor to support four PCI Masters, Rotating Priority Mechanism, and Hidden Arbitration Scheme Minimizes Arbitration Overhead.

There are four interrupts in each PCI slot: INTA#, INTB#, INTC#, and INTD#. Since the **EP-58VP3A** adapts the PCI auto configuration with the system BIOS Setup utility. When the system is turned on after adding a PCI add-in card, the BIOS automatically configure interrupts, DMA channels, I/O space, and other parameters. You do not have to configure jumpers or worry about potential resource conflicts. Because PCI cards use the same interrupt resource as ISA cards, you must specify the interrupt used by ISA add-in cards in the BIOS Setup utility.

However, if a 'Legacy card' such as plugging a paddle card and cable into an ISA slot is plugged in the system, modification in the **ROM SETUP UTILITY** becomes necessary. First of all, you must enter **PCI CONFIGURATION SETUP** utility from the **ROM SETUP UTILITY** main menu to set 'ISA' for the **'PCI IDE IRQ MAP TO**.

Secondly, you must enter the **CHIPSET FEATURES SETUP UTILITY** from the **ROM SETUP UTILITY** main menu and set 'Disabled' for the **'Onboard Primary PCI IDE** and the **Onboard Secondary PCI IDE**. When you plug PCI IDE cards into the system, you should select 'Disabled' for the **Onboard Primary and Secondary PCI IDE** from the **CHIPSET FEATURES SETUP UTILITY** too.

You can set the system interrupt request (IRQ) on some 'Legacy cards' which have on paddle card and cable. Refer to user's manual of the card to a proper system IRQ level. In general, card's Primary is assigned to INTA and Secondary is assigned to INTB. If the card is plugged into slot 1 marked PCI#1, you cannot use second slot marked PCI#2 because the secondary INT signal takes INTB from the slot. Refer to Page 3-12 for circuit diagram. The user then enters the **PCI CONFIGURATION SETUP** utility from the **ROM SETUP UTILITY** main menu and set 'PCI Slot 1' for the **'PCI IDE IRQ MAP TO**. (This depends on the slot # where the Legacy card is plugged)

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CHAPTER 3
AWARD BIOS SETUP

Award's ROM BIOS provides a built-in setup program which allows user to modify the basic system configurations and hardware parameters. The modified data will be stored in a battery-backed CMOS RAM so that data will be retained even when the power is turned off. In general, the information saved in the CMOS RAM stays unchanged unless there is a configuration change in the system, such as a hard drive replacement or a new device installation.

If this does happen, you will need to reconfigure your configuration parameter.

To Enter Setup Propgram

Power on the computer and press <**Del**> key immediately. This will bring you into BIOS **CMOSSETUPUTILITY**.

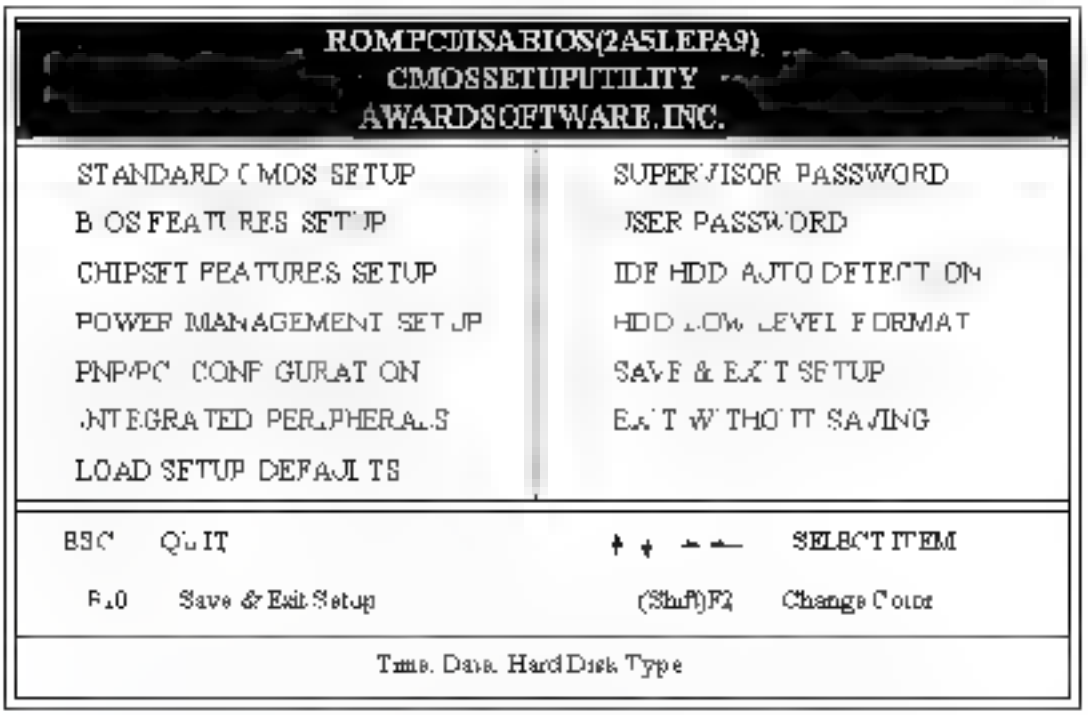

Figure 3-1 CMOS SETUPUTILITY

The menu displays all major selection items. Select the item you need to reconfigure. The selection is made by moving cursor (press any direction key) to the item and press the Enter key. An on-line help message is displayed at the bottom of the screen as the cursor is moving to various items which provides a better understanding of each function. When a selection is made, the menu of selected item will appear so the user can modify the associated configuration parameters.

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3-1 STANDARD CMOS SETUP

Choose "**STANDARD CMOS SETUP**" in the **CMOS SETUP UTILITY** Menu (Fig 3. The **STANDARD CMOS SETUP** allows user to configure system setting such as the current date and time, type of hard disk installed, floppy type and display type. Memory size is auto-detected by the BIOS and displayed for your reference. When a field is highlighted, use direction keys to move cursor and <Enter> key to select, the entries in the field will be changed by pressing <PgDn> or <PgUp> keys or user can enter new data directly from the keyboard.

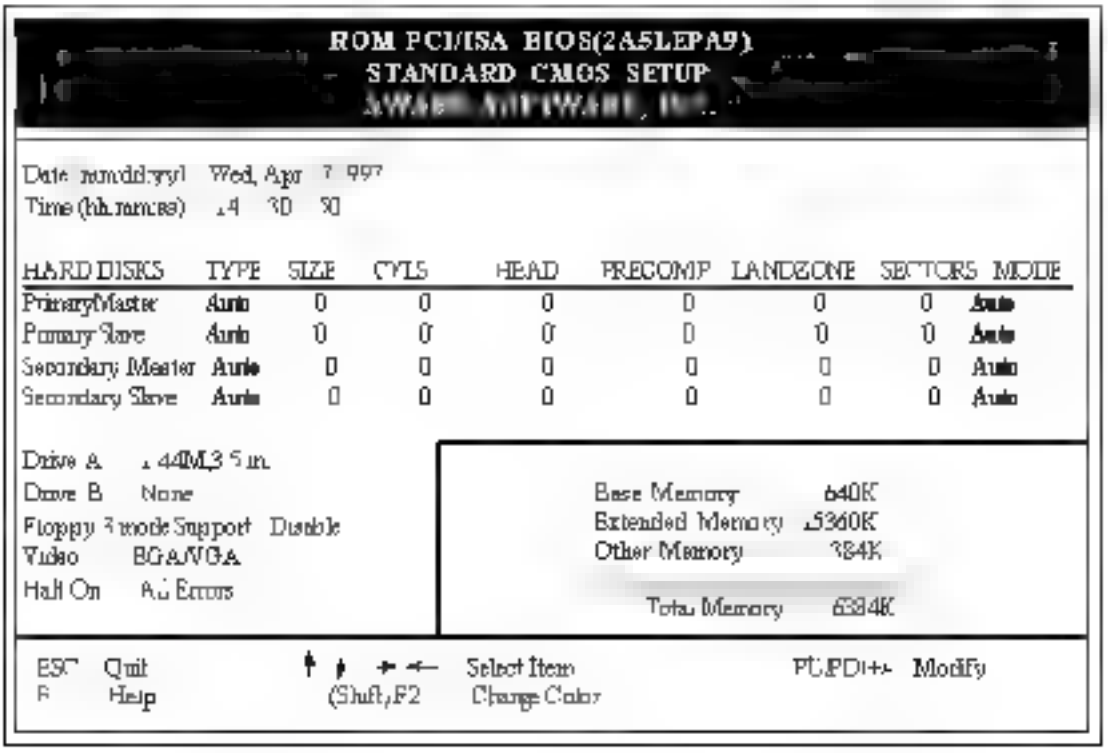

Figure 3-2 STANDARD CMOS SETUP

NOTE: If the Primary Master/Slave and the Secondary Master/Slave are set as "Auto", the hard disk size and mode will be auto-detected.

NOTE The "**Halt On**" field is to determine when to halt the system by the BIOS if an error occurs.

3-2 BIOS FEATURES SETUP

By selecting the "**BIOS FEATURES SETUP**" option in the CMOS SETUP UTILITY menu, user can change system related parameters in the displayed menu. This menu shows all of the manufacturer's default values of the EP-5BVP3A. Again, user can move the cursor by pressing direction keys and <PgDn> or <PgUp> keys to modify the parameters. Pressing [F1] key to display help message of the selected item.

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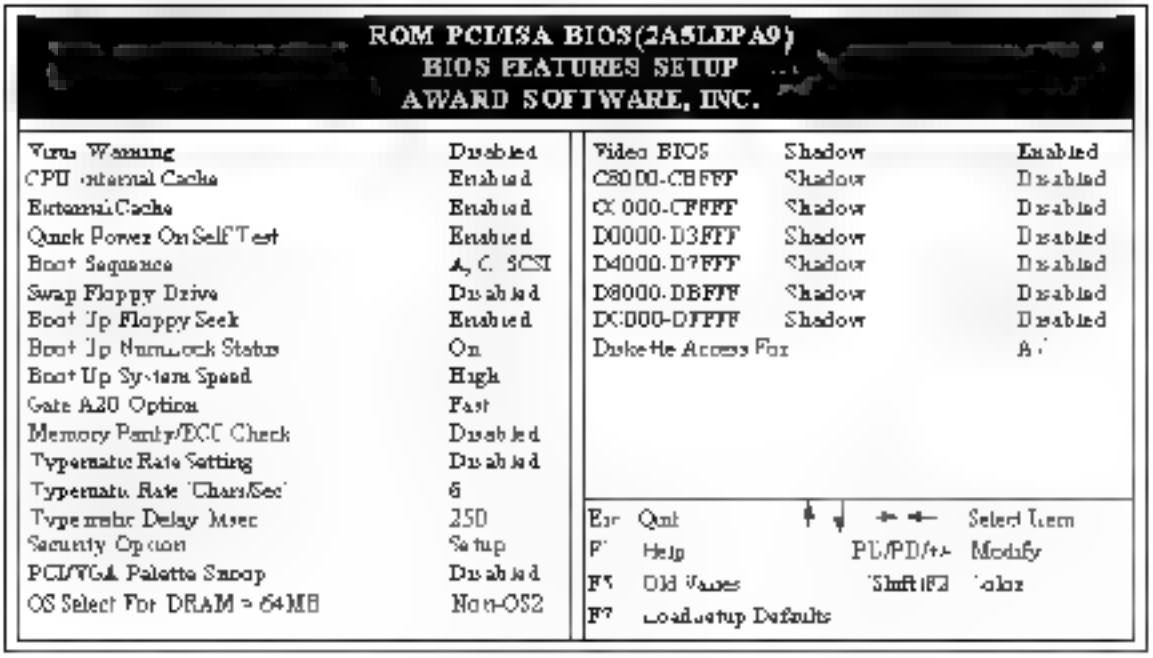

Figure 3-3 BIOS FEATURES SETUP

Note The **Security Option** contains **"setup"** and **"system"**. The "**setup**" indicates that the password setting is for CMOS only while the "**system**" indicates the password setting is for both CMOS and system boot up.

- **Virus Warning.** This category flashes on the screen. During and after the system boots up, any attempt to write to the boot sector or partition table of the hard disk drive will halt the system and an error message will appear. You should then run an anti-virus program to locate the virus. Keep in mind that this feature protects only the boot sector, not the entire hard drive. Default value is Disabled.

  Enabled Activates automatically when the system boots up causing a warning message to appear when any attempt to access the boot sector or hard disk partition table.

  Disabled No warning message to appear when any attempt to access the boot sector or hard disk partition table.

- **CPU Internal Cache / External Cache** These two categories speed up memory access. However, it depends on CPU/chipset design. The default value is Enabled. If your CPU is without Internal Cache then this item "CPU Internal Cache" will not be shown.

  Enabled Enable cache.

  Disabled Disable cache.

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- **Quick Power On Self Test** This category speeds up Power On Self Test (POST) after you power on the computer If it is set to Enable. BIOS will shorten or skip some checking items during POST
  Enabled Enable quick POST
  Disabled Normal POST

- **Boot Sequence**: This category determines which drive is searched first for the O/S(Operating System The default value is A,C
  A,C - The system will search for floppy disk drive first then hard disk drive
  C,A - The system will search for hard disk drive first then floppy disk drive

- **Swap Floppy Drive** This will swap your physical drive letters A&B if you are using two floppy disks The default value is Disabled
  Enabled Floppy A & B will be swapped under the O/S
  Disabled - Floppy A & B will be not swapped

- **Boot Up Floppy Seek** During Power On Self Test (POST) BIOS will determine if the installed floppy drive is 40 or 80 tracks Only 360K type is 40 tracks while 760K 1.2M and 1.44M are all 80 tracks The default value is Enabled
  Enabled BIOS searches for floppy disk drive to determine if it is 40 or 80 tracks Note that BIOS cannot tell from 720K 1.2M or 1.44M drive type as they are all 80 tracks
  Disabled BIOS will not search for the type of floppy disk drive by track number Note that there will not be any warning message if the drive installed is 360K

- **Boot Up NumLock Status** The default value is On
  On - Keypad is number keys
  Off - Keypad is arrow keys

- **Boot UP System Speed** Select default system speed The system will run at the selected speed after the system boots
  High Set the speed to high
  Low Set the speed to low

- **Gate A20 Option** This refers to the way the system addresses memory above 1MB (extended memory) The default value is Fast
  Normal The A20 signal is controlled by keyboard controller or chipset hardware
  Fast : The A20 signal is controlled by Port 92 or chipset specific method

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- **Typematic Rate Setting:** This determines the typematic rate
  Enabled Enable typematic rate and typematic delay programming
  Disabled Disable typematic rate and typematic delay programming. The system BIOS will use default value of these items and the default is controlled by the keyboard

- **Typematic Rate(Chars/Sec)**

6: 6 characters per second	**8: 8 characters per second**
10: 10 characters per second	**12: 12 characters per second**
15: 15 characters per second	**20: 20 characters per second**
24: 24 characters per second	**30: 30 characters per second**

- **Typematic Delay(Msec):** This determines the time between the first and second character displayed when holding a key
  250: 250msec
  500: 500msec
  750: 750msec
  1000: 1000msec

- **Security Option:** This category allows you to limit access to the system and Setup or just to Setup. The default value is Setup
  System The system will not boot and the access to Setup will be denied if the correct password is not entered at the prompt
  Setup The system will boot, but the access to Setup will be denied if the correct password is not entered at the prompt

- **PCI/VGA Palette Snoop:** This field controls the ability of a primary PCI VGA controller to share a common palette when a snoop write cycles with an ISA video card. The default value is Disabled.
  Enabled If an ISA card connects to a PCI VGA card via the VESA connector and the ISA card connects to VGA monitor and uses the RAMDAC of PCI card, the PCI/VGA Palette Snoop is enabled
  Disabled: Disable the VGA card Palette snoop function.

- **Video BIOS Shadow:** It determines whether video BIOS will be copied to RAM. However, it is optional from chipset design. Video Shadow will increase the video speed.
  Enabled Video shadow is enabled
  Disabled: Video shadow is disabled

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- **C8000 CBFFF Shadow.**
  CC000 CFFFF Shadow:
  D0000 D3FFF Shadow:
  D4000 D7FFF Shadow:
  D8000 DBFFF Shadow:
  DC000 DFFFF Shadow:

These categories determine whether optional ROM will be copied to RAM by 16K byte or 32K byte per unit and the size depends on the chipset.
Enabled . Optional shadow is enabled.
Disabled: Optional shadow is disabled.

3.3 CHIPSET FEATURES SETUP

Choose the "**CHIPSET FEATURES SETUP**" in the CMOS SETUP UTILITY menu to display the following menu.

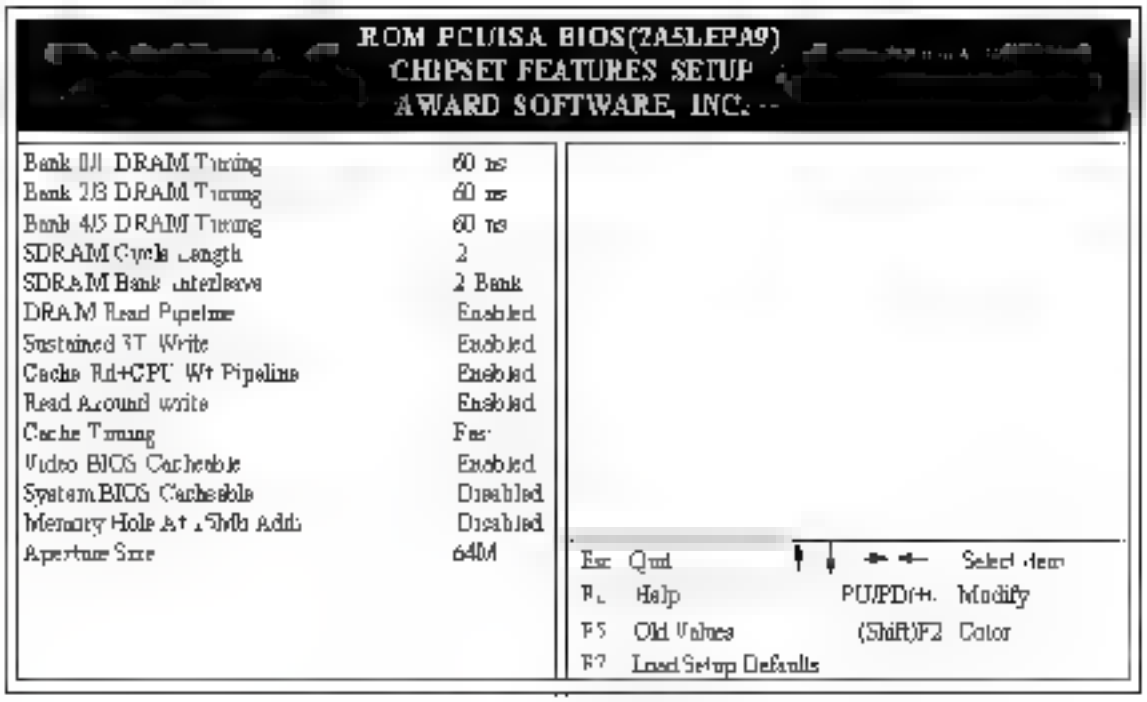

Figure3-4 CHIPSET FEATURES SETUP

Note: When you insert slower memory modules in the system and set a faster timing, maybe the system will hang up

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- **DRAM Timing:** The default value is 60ns.
  60ns : 2 (faster) Burst Wait State, for 60~70ns Fast Page Mode/EDO DRAM
  70ns : 3 slower) Burst Wait State, for 70ns Fast Page Mode/EDO DRAM

- **Video BIOS Cacheable:** The default value is Enabled
  Enabled : Enabled the Video BIOS Cacheable to speed up the VGA Performance.
  Disabled: Disabled the Video BIOS Cacheable function.

- **Memory Hole at 15M-16M:** The default value is Disabled.
  Disabled: Normal Setting
  Enabled . This field enableds the man memory (15~16MB, remap to ISA BUS.

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3-4 POWER MANAGEMENT SETUP

Choose the "POWER MANAGEMENT SETUP" in the CMOS SETUP UTILITY to display the following screen. This menu allows the user to modify the power management parameters and IRQ signals. In general, these parameters should not be changed unless it is absolutely necessary.

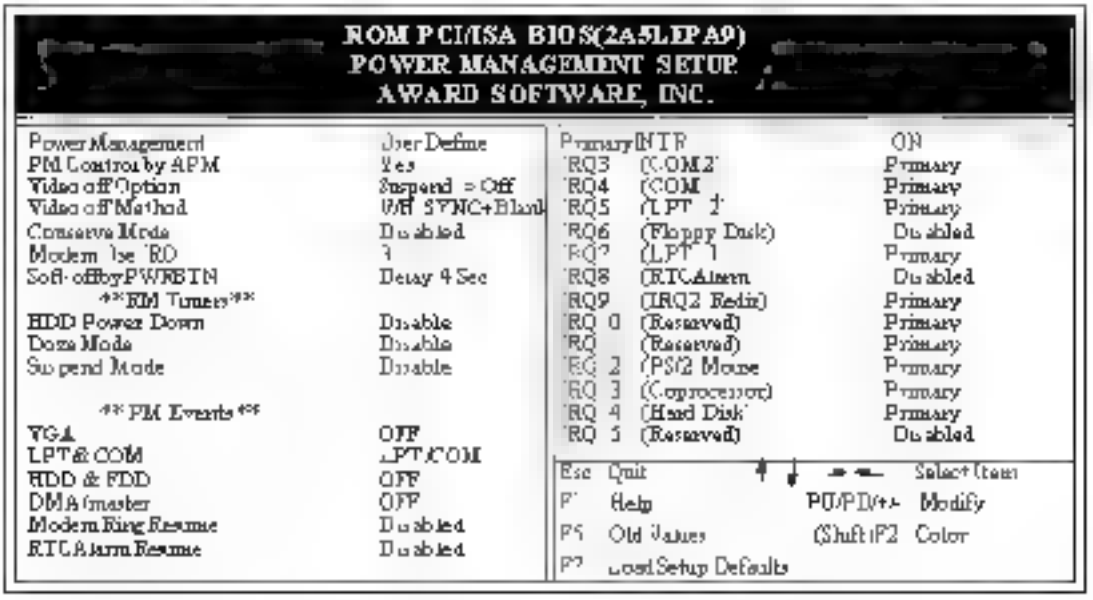

Figure 3-5 POWER MANAGEMENT SETUP

Again, users can move the cursor by pressing direction keys to the field needed to be modified and press <PgDn> or <PgUp> to alter item selection. You can only change the content of **Doze Mode**, **Standby Mode**, and **Suspend Mode** when the **Power Management** is set to **User Define**.

3-3-1 The Description of the Power Management

A. Power Management mode selection

Disabled The system operates in NORMAL conditions (Non GREEN) and the Power Management function is disabled.

Max. saving: This mode will maximize the power saving capability.

Min. saving: This mode will minimize the power saving capability.

User define: Allow user to define time out parameters to control power saving mode. Refer to item B shown below.

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B. Time-out parameters

HDD Standby
HDD Standby timer can be set from 1 to 15 minute(s)

System Doze
The "System Doze" mode timer starts to count when there is no 'PM events' occurred. The valid time-out setting is from 1 minute up to 1 hour

System Suspend
This function works only when the Pentium Processor is installed. The timer starts to count when 'System Standby' mode timer is timed out and no 'PM Events' occurred. Valid range is from 1 minute up to 1 hour

3-3-2 Description of the Green Functions

The **P55VP3** supports HDD Power Down, Doze and Suspend power saving functions. In addition, the hardware suspend function is supported when the J3 (2-3) (Refer to Figure2-4) is closed to enter the Suspend function.
The detailed description of these functions is provided in the next page

HDD Standby Mode
When system stops reading or writing HDD, the timer starts to count. The system will cut off the HDD power when timer runs out of time. The system will not resume operation until either a read from or a write to HDD command is executed again.

Doze Mode
The system hardware will drop down CPU clock from normal working speed when Doze mode time-out occurs

Suspend Mode
When the system suspend timer times out, the system will enter the suspend mode and the chipset will stop CPU clock immediately. The power consumption in Suspend Mode is lower than in standby mode. The screen is also blanked out

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PMEvents:
AWARD BIOS defines 7 PM Events a the power management mode (Doze & suspend). The user can enhance any PM Events to be "Enable" or "Disable" When the system detects all of the enabled events do not have any activity it will start the system Doze timer first if the "Power Management" is not "Disabled" Once the system Doze timer is timed out, it will process doze power saving procedure by starting the system suspend timer When the suspend timer times out all of the CPU clock will stop by dropping system c ock down to zero and remains this way until any one of the "Enabled" event occurs

3-5 PNP/PCI CONFIGURATION

The PNP/PCI configuration program is for the user to modify the PCI ISA IRQ signals when various PCI/ISA cards are inserted in the PCI or ISA slots

WARNING Any misplacing IRQ could cause system can't pick up all the resources

ROM PCI/ISA BIOS(2A5LEPA9)
PNP/PCI CONFIGURATION
AWARD SOFTWARE, INC.

PNP Installed		No	CPU to PCI Write Buffer	Enabled
Resources Controlled By		Manual	PCI Dynamic Bursting	Enabled
Reset Configuration Data		Disabled	PCI Master 0 WS Write	Enabled
			PCI Delay Transaction	Enabled
IRQ-3	assigned to	Legacy ISA	PCI Master Read Prefetch	Enabled
IRQ-4	assigned to	Legacy ISA	PCI#2 Access #1 Retry	Disabled
IRQ-5	assigned to	PCI/ISA PnP	AGP Master 1 WS Write	Enabled
IRQ-7	assigned to	Legacy ISA	AGP Master 1 WS Read	Disabled
IRQ-9	assigned to	PCI/ISA PnP		
IRQ-10	assigned to	PCI/ISA PnP	PCI IRQ Actived By	Level
IRQ-11	assigned to	PCI/ISA PnP	PCI/IDE IRQ Map To	PCI-AUTO
IRQ-12	assigned to	PCI/ISA PnP	Primary IDE INT#	A
IRQ-14	assigned to	Legacy ISA	Secondary IDE INT#	B
IRQ-15	assigned to	Legacy ISA		
DMA-0	assigned to	PCI/ISA PnP		
DMA-1	assigned to	PCI/ISA PnP		
DMA-3	assigned to	PCI/ISA PnP		
DMA-5	assigned to	PCI/ISA PnP		
DMA-6	assigned to	PCI/ISA PnP		
DMA-7	assigned to	PCI/ISA PnP		

ESC	Quit	↑ ↓ → ←	Select Item
F1	Help	PU/PD/+/-	Modify
F5	No Change	(Shift) F2	Color
F7	Load Setup Defaults		

Figure 3-6 PCI CONFIGURATION SETUP

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- **Resource Controlled By**:The default value s Manua.

  Manual: The field defines that the PNP Card s resource is controlled by manua. Yo , can setup whether IRQ-X or DMA-X is assigned to PCI/ISA PNP or Legacy ISA Cards

  Auto: If your ISA card and PCI card are al PNP r ards Set this field to 'Auto' The BIOS wil ass gn the interrupt resource automatically

- **Reset Configuration Data**: The default value s Disabled

  Disabled: Norma Setting

  Enabled: If you plug some Legacuy cards n the system and record into ESCD (Extended System Configurahon Data You can set this field to be Enabled and to clear ESCD at one time when some Legacy cards are removed

- **PCI IDE IRQ Map To**:The default value is PCI AUTO

  When you have true PCI cards plugged nto the system, you will not need to change any thing here in the **SETUP** program However if you do not know whether you are using a true PCI card, please refer to your PCI card user s manual for the details

  When you have a Legacy card described in section 2 5 to plug nto the system,s proper setting is extremely important or it may r ause the system hung up The diagram shown below tells yo , how the Rotating Priority Mechanism s designed

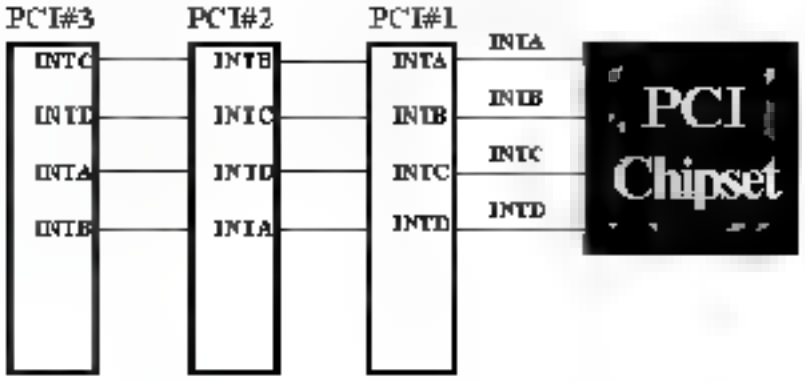

Figure 3-7 The Combination of PCI INT# lines

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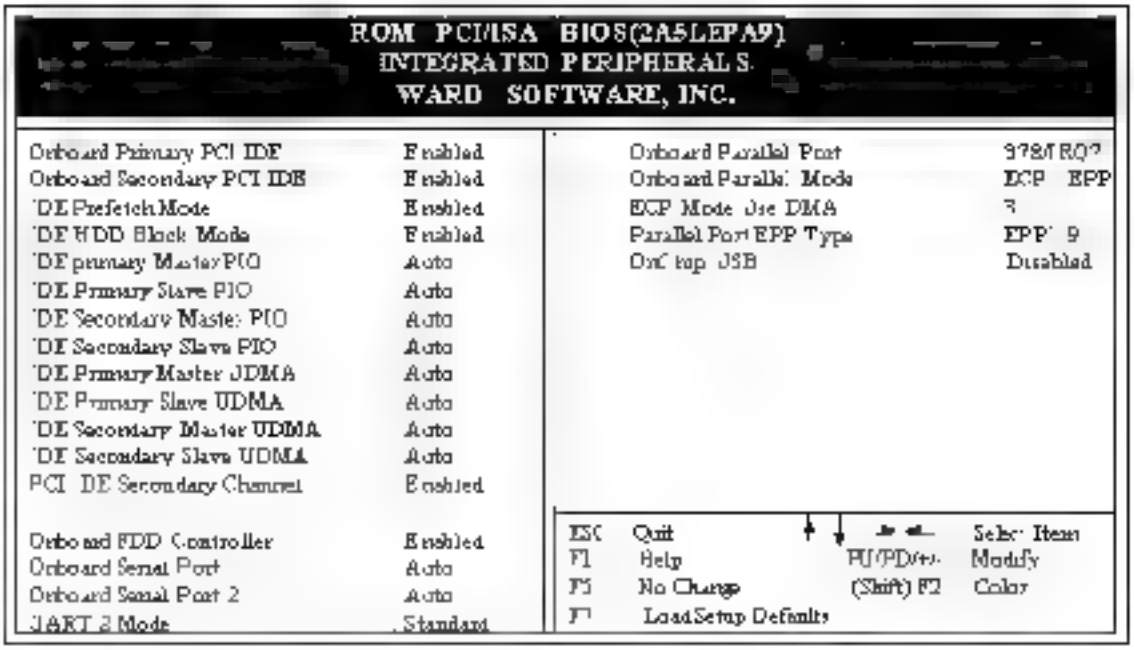
3.6 INTEGRATED PERIPHERALS



Note: If you don't use the Onboard IDE connector, but use On-card (PCI or ISA card) IDE connector You have to set Onboard Primary PCI IDE Disabled and Onboard Secondary PCI IDE. Disabled from CHIPSET FEATURES SETUP UTILITY
The Onboard PCI IDE cable should be equal to or less than 18 inches (45 cm.).

- **IDE HDD Block Mode**: The default value is Enabled
  Enabled Enabled IDE HDD Block Mode The HDD transfer rate is better than Disable
  Disabled Disable IDE HDD Block Mode

- **PCI Slot IDE 2nd Channel**: The default value is Enabled
  Enabled Enable secondary IDE port and BIOS will assign IRQ15 for this port
  Disabled Disable secondary IDE port and IRQ 15 is available for other device

- **Onboard Primary PCI IDE**: The default value is Enabled
  Enabled Enable Onboard 1st channel IDE port
  Disabled Disable Onboard 1st channel IDE port When use On-card (PCI or ISA card) IDE connector

- **Onboard Secondary PCI IDE**: The default value is Enabled
  Enabled Enable Onboard 2nd channel IDE port
  Disabled Disable Onboard 2nd channel IDE port When use On-card (PCI or ISA card) IDE connector

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- **IDE Primary Master PIO**: The default value is Auto
  - ***Auto*** BIOS will automatically detect the Onboard Primary Master PCI IDE HDD Accessing mode
  - ***Mode0~4*** Manually set the IDE Accessing mode

- **IDE Primary Slave PIO**: The default value is Auto
  - ***Auto*** BIOS will automatically detect the Onboard Primary Slave PCI IDE HDD Accessing mode
  - ***Mode0~4*** Manually set the IDE Accessing mode

- **IDE Secondary Master PIO**: The default value is Auto
  - ***Auto*** BIOS will automatically detect the Onboard Secondary Master PCI IDE HDD Accessing mode
  - ***Mode0~4*** Manually set the IDE Accessing mode

- **IDE Secondary Slave PIO**: The default value is Auto
  - ***Auto*** BIOS will automatically detect the Onboard Secondary Slave PCI IDE HDD Accessing mode
  - ***Mode0~4*** Manually set the IDE Accessing mode

- **Onboard FDC Controller**: The default value is Enabled.
  - ***Enabled*** Enable the Onboard floppy drive interface controller
  - ***Disabled*** Disable the Onboard floppy drive interface controller When using On-card ISA FDC's controller

- **Onboard UART 1**: This field allows the user to select the serial port. The default value is 3F8H/IRQ4
  - ***COM1*** Enable Onboard Serial port 1 and address is 3F8H/IRQ4
  - ***COM2*** Enable Onboard Serial port 1 and address is 2F8H/IRQ3
  - ***COM3*** Enable Onboard Serial port 1 and address is 3E8H/IRQ4
  - ***COM4*** Enable Onboard Serial port 1 and address is 2E8H/IRQ3
  - ***Disabled*** Disable Onboard Serial port 1

- **Onboard UART 2**: This field allows the user to select the serial port. The default value is 2F8H/IRQ3
  - ***COM1*** Enable Onboard Serial port 2 and address is 3F8H/IRQ4
  - ***COM2*** Enable Onboard Serial port 2 and address is 2F8H/IRQ3
  - ***COM3*** Enable Onboard Serial port 2 and address is 3E8H/IRQ4
  - ***COM4*** Enable Onboard Serial port 2 and address is 2E8H/IRQ3
  - ***Disabled*** Disable Onboard Serial port 2

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- **Onboard UART 2 Mode** The default value is standard. This field allows the User to select the COM2 port that can support a serial Infrared Interface
  Standard: Support a Serial Infrared Interface IrDA
  HPSIR Support a HP Serial Infrared Interface format
  ASKIR. Support a Sharp Serial Infrared Interface format

- Onboard **Parallel port** This field allows the user to select the LPT port. The default value is 378H IRQ7
  378H Enable Onboard LPT port and address is 378H and IRQ7
  278H Enable Onboard LPT port and address is 278H and IRQ5
  3BCH Enable Onboard LPT port and address is 3BCH and IRQ7
  Disabled Disable Onboard LPT port

NOTE: **Parallel Port address is 378H/3BCH that selects the rounting of IRQ7 for LPT1**
Parallel Port address is 278H that selects the rounting of IRQ5 for LPT1

- **Parallel port Mode**: This field allows the user to select the parallel port mode
  The default value is ECP+EPP
  Normal Standard mode IBM PC AT Compatible bidirectional parallel port
  EPP Enhanced Parallel Port mode
  ECP Extended Capability Port mode
  EPP+ECP ECP Mode & EPP Mode

  ECP Mode USE DMA. This field allows the user to select DMA-1 or DMA-3 for the ECP mode. The default value is DMA-3
  DMA1 The filed selects the rounting of DMA-1 for the ECP mode
  DMA3 The filed selects the rounting of DMA-3 for the ECP mode

3-7 LOAD SETUP DEFAULTS

The "LOAD SETUP DEFAULTS" function loads the system default data directly from ROM and initializes the associated hardware properly. This function will be necessary only when the system CMOS data is corrupted

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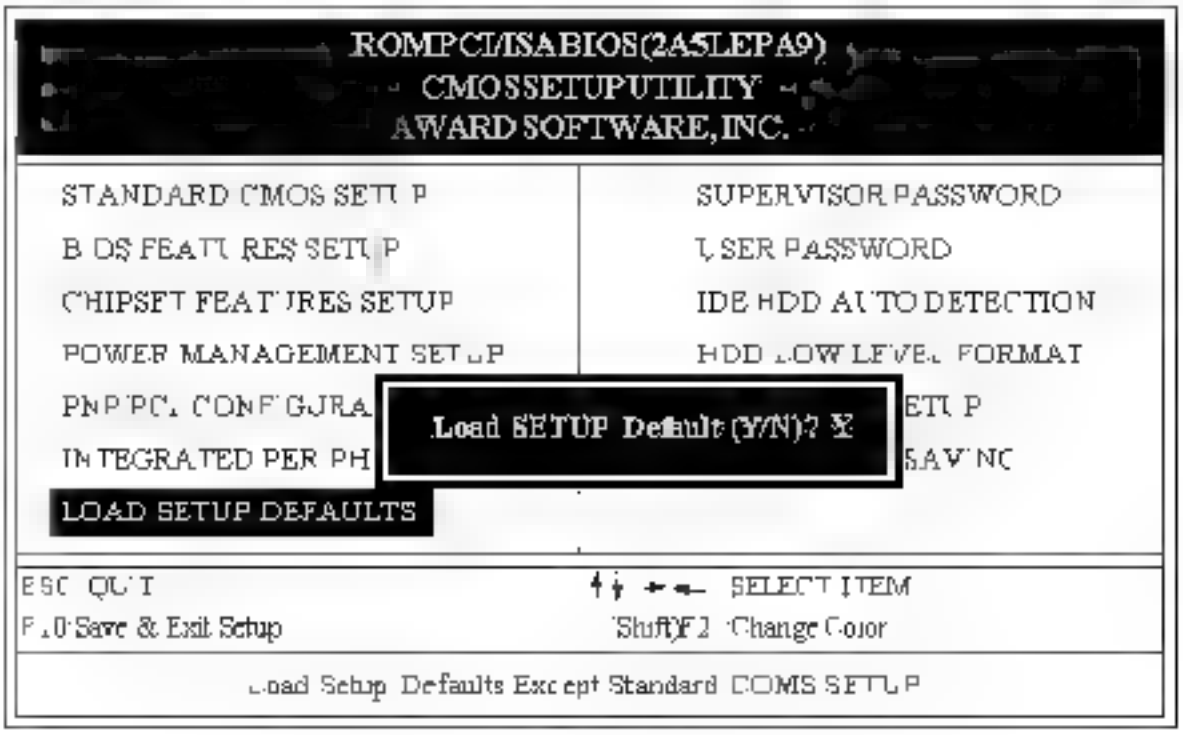

Figure 3-8 LOAD SETUP DEFAULT

3-8 CHANGE SUPERVISOR or USER PASSWORD

To change the password, choose the **'SUPERVISOR PASSWORD or USER PASSWORD'** option from the **CMOS SETUP UTILITY** menu and press [Enter].

NOTE Either **"Setup"** or **"System"** must be selected in the **"Security Option"** of the **BIOS FEATURES SETUP** menu. (Refer to Figure 3-3 for the details.)

1 If CMOS is corrupted or the option is not used, a default password stored in the ROM will be used. The screen will display the following message:

Enter Password:

Press the [Enter] key to continue after proper password is given.

2 If CMOS is corrupted or the option was used earlier and the user wish to change default password, the **SETUP UTILITY** will display a message and ask for a confirmation.

Confirm Password:

3 After pressing the [Enter] key (ROM password if the option was not used) or current password (user defined password), the user can change the password and store new one in CMOS RAM. A maximum of 8 characters can be entered.

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3-9 IDE HDD AUTO DETECTION

The "IDE HDD AUTO DETECTION" utility is a very useful tool especially when you do not know which kind of hard disk type you are using. You can use this utility to detect the correct disk type installed in the system automatically. But now you can set **HARD DISK TYPE** to **Auto** in the **STANDARD CMOS SETUP**. You do not need the "IDE HDD AUTO DETECTION" utility. The BIOS will Auto-detect the hard disk size and mode on display during POST.

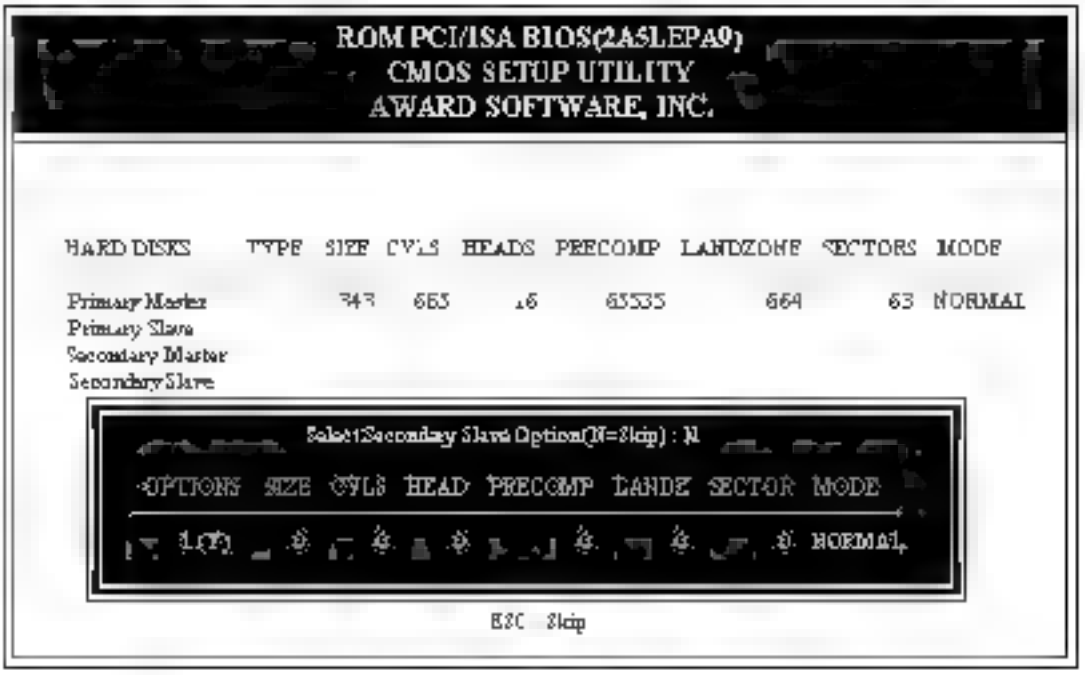

Figure 3-9 IDE HDD AUTO DETECTION

NOTE: HDD Modes

The Award BIOS supports 3 HDD modes: NORMAL, LBA and LARGE.

NORMAL mode

Generic access mode that is neither the BIOS nor the IDE controller will make transformations during accessing.

The maximum numbers of cylinders, head & sectors for NORMAL mode are 1024, 16 and 63.

	no. Cylinder	1024
x	no. Head	16
x	no. Sector	63
x	no. per sector	512
		528 Megabytes

If an user sets the HDD to NORMAL mode, the maximum accessible HDD size will be 528 Megabytes even though its physical size may be greater than that.

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LBA (Logical Block Addressing) mode: This is a new HDD accessing method to overcome the 528 Megabyte bottleneck.

The number of cylinders, heads and sectors shown in the setup may not be the number physically contained in the HDD.

During the HDD accessing, the IDE controller will transform the logical address described by sector, head and cylinder into its own physical address inside the HDD.

The maximum HDD size supported by LBA mode is 8.4 Gigabytes which is obtained by the following formula:

no. Cylinder	1024
x no. Head	255
x no. Sector	63
x bytes per sector	(512)
	8.4 Gigabytes

LARGE mode: This is an extended HDD access mode supported by Award Software.

Some IDE HDDs contain more than 1024 cylinders without LBA support. In some cases, user does not want LBA. The Award BIOS provides another alternative to support these kinds of LARGE mode.

CYLS.	HEADS	SECTOR	MODE
1120	16	59	NORMAL
560	32	59	LARGE

BIOS tricks DOS or other OS that the number of cylinders is less than 1024 by dividing it by 2. At the same time, the number of heads is multiplied by 2. A reverse transformation process will be made inside INT 13h in order to access the right HDD address.

Maximum HDD size:

no. Cylinder	1024
x no. Head	(32
x no. Sector	63
x bytes per sector	(512)
	1 Gigabytes

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Note

To support LBA or LARGE mode of HDDs there must be some softwares involved. All softwares are located in the Award HDD Service Routine (INT 13h). It may fail to access a HDD with LBA (LARGE) mode selected if you are running under an Operating System which replaces the whole INT 13h. UNIX operating systems do not support either LBA or LARGE and must utilize the Standard mode. UNIX can support drives larger than 528MB.

3-10 HDD LOW LEVEL FORMAT

Interleave

Select the interleave number of the hard disk drive that you wish to perform a low level format on. You may select from 1 to 8. Check the documentation that came with the drive for the correct interleave number, or select 0 for automatic detection.

Auto scan bad track

This allows the utility to scan first then format by each track.

Start

Press <Y> to start low level format.

3-11 SAVE & EXIT SETUP

The "SAVE & EXIT SETUP" option will bring you back to boot up procedure with all the changes you just recorded in the CMOS RAM.

3-12 EXIT WITHOUT SAVING

The "EXIT WITHOUT SAVING" option will bring you back to normal boot up procedure without saving any data into CMOS RAM. All old data in the CMOS will not be destroyed.

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Chapter 4
Technical Information

4.1 I/O & MEMORY MAP

MEMORY MAP

Address Range	Size	Description
[00000-7FFFF]	512K	Conventional memory
[80000-9FBFF]	127K	Extended Conventional memory
[9FC00-9FFFF]	1K	Extended BIOS data area if PS/2 mouse is installed
[A0000-C7FFF]	160K	Available for Hi DOS memory
[C8000-DFFFF]	96K	Available for Hi DOS memory and adapter ROMs
[E0000-EFFFF]	60K	Available for UMB
[F0000-F7FFF]	32K	BIOS CMOS setup utility
[F8000-FCFFF]	20K	BIOS runtime service routine (2)
[FD000-FDFFF]	4K	Plug and Play ESCD data area
[FE000-FFFFF]	8K	BIOS runtime service routine 1

I/O MAP

[000-01F]	DMA controller 1 (Master)
[020-021]	INTERRUPT CONTROLLER 1 (Master)
[022-023]	CHIPSET control registers I/O ports
[040-05F]	TIMER control registers
[060-06F]	KEYBOARD interface controller (8042)
[070-07F]	RTC ports & CMOS I/O ports
[080-09F]	DMA register
[0A0-0BF]	INTERRUPT controller 2 (Slave)
[0C0-0DF]	DMA controller 2 (Slave)
[0F0-0FF]	MATH COPROCESSOR
[1F0-1F8]	HARD DISK controller
[278-27F]	PARALLEL port 2
[2B0-2DF]	GRAPHICS adapter controller
[2F8-2FF]	SERIAL port 2
[360-36F]	NETWORK ports
[378-37F]	PARALLEL port
[3B0-3BF]	MONOCHROME & PARALLEL port adapter
[3C0-3CF]	EGA adapter
[3D0-3DF]	CGA adapter
[3F0-3F7]	FLOPPY DISK controller
[3F8-3FF]	SERIAL port 1

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4-2 TIME & DMA CHANNELS MAP

TIME MAP:	TIMER Channel 0	System timer interrupt
	TIMER Channel 1	DRAM REFRESH request
	TIMER Channel 2	SPEAKER tone generator
DMA CHANNELS	DMA Channe 0	Available
	DMA Channel 1	Onboard ECP Option
	DMA Channel 2	FLOPPY DISK (SMC CHIP
	DMA Channel 3	Onboard ECP default
	DMA Channe 4	Cascade for DMA controller 1
	DMA Channe 5	Available
	DMA Channe 6	Available
	DMA Channel 7	Available

4-3 INTERRUPT MAP

NMI -		Parity check error
IRQ (H/W)	0	System TIMER interrupt from TIMER 0
	1	KEYBOARD output buffer full
	2	Cascade for IRQ 8-15
	3	SERIAL port 2
	4	SERIAL port 1
	5	PARALLEL port 2
	6	FLOPPY DISK SMC CHIP
	7	PARALLEL port 1
	8	RTC clock
	9	Available
	10	Available
	11	Available
	12	PS/2 Mouse
	13	MATH coprocessor
	14	Onboard HARD DISK(IDE1 channe
	15	Onboard HARD DISK(IDE2 channe

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4.4 RTC & CMOS RAM MAP

RTC & CMOS		
	00	Seconds
	01	Second alarm
	02	Minutes
	03	Minutes alarm
	04	Hours
	05	Hours alarm
	06	Day of week
	07	Day of month
	08	Month
	09	Year
	0A	Status register A
	0B	Status register B
	0C	Status register C
	0D	Status register D
	0E	Diagnostic status byte
	0F	Shutdown byte
	10	FLOPPY DISK drive type byte
	11	Reserve
	12	HARD DISK type byte
	13	Reserve
	14	Equipment type
	15	Base memory low byte
	16	Base memory high byte
	17	Extension memory low byte
	18	Extension memory high byte
	19-2D	
	2E-2F	
	30	Reserved for extension memory low byte
	31	Reserved for extension memory high byte
	32	DATE CENTURY byte
	33	INFORMATION FLAG
	34-3F	Reserve
	40-7F	Reserved for CHIPSET SETTING DATA

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APPENDIX A: POST CODES

ISA POST codes are typically output to port address 80h.

POST(hex)	DESCRIPTION
01-02	Reserved.
C0	Turn off OEM specific cache, shadow
03	1 Initialize ESA registers (ESA BIOS only) 2 Initialize all the standard devices with default values Standard devices includes DMA controller (8237) Programmable Interrupt Controller (8259) Programmable Interval Timer (8254 RTC chip
04	Reserved.
05	1 Keyboard Controller Self Test 2 Enable Keyboard Interface
06	Reserved.
07	Verifies CMOS's basic R/W functionality
C1	Auto-detection of onboard DRAM & Cache
C5	Copy the BIOS from ROM into E0000 FFFFF shadow RAM so that POST will go faster
08	Test the first 256K DRAM
09	OEM specific cache initialization (if needed)
0A	1 Initialize the first 32 interrupt vectors with corresponding interrupt handlers Initialize INT no from 33 to 120 with Dummy (Suprious) Interrupt Handler 2 Issue CPUID instruction to identify CPU type 3 Early Power Management initialization OEM specific
0B	1 Verify the RTC time is valid or not 2 Detect bad battery 3 Read CMOS data into BIOS stack area 4 PnP initializations including PnP BIOS only) Assign CSN to PnP ISA card Create resource map from ESCD 5 Assign IO & Memory for PCI devices PCI BIOS only

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POST(hex)	DESCRIPTION
0C	nitialization of the BIOS Data Area 40:0N 40:FF)
0D	Program some of the Chipset s value ac cording .o Setup 'Early Setup Value Program) 2 Measure CPU speed for display & decide the system clock speed. 3 Video initialization including Monochrome. CGA ECA/VGA If no display device found, the speaker will beep
0E	Test video RAM .F Monochrome display device found) 2 Show messages including ·Award Logo. Copyright string. B OS Data code & Part No ·OEM specific sign on messages ·Energy Star Logo Green B OS ONLY) ·CPU brand, type & speed Test system BIOS checksum (Non-Compress Version only)
0F	DMA channel 0 test
10	DMA channel test
11	DMA page registers test
12-13	Reserved
14	Test 8254 Timer 0 Counter 2
15	Test 8259 interrupt mask bits for channel
16	Test 8259 interrupt mask bits for channel 2
17	Reserved
19	Test 8259 functionality
1A-1D	Reserved
1E	If EISA NVM checksum s good, execute EISA initialization. EISA BIOS only)
1F-29	Reserved
30	Detect Base Memory & Extended Memory Size
31	Test Base Memory from 256K to 640K 2 Test Extended Memory from M to the top of memory

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POST(hex)	DESCRIPTION
32	1. Display the Award Plug & Play BIOS Extension message (PnP BIOS only) 2. Program all onboard super I/O chips (if any) including COM ports, LPT ports, FDD port according to setup value
33-3B	Reserved.
3C	Set flag to allow users to enter CMOS Setup Utility
3D	1. Initialize Keyboard 2. Install PS2 mouse
3E	Try to turn on Level 2 cache Note: Some chipset may need to turn on the L2 cache in this stage. But usually the cache is turn on later in POST 6Fh
3F-40	Reserved.
BF	Program the rest of the Chipset's value according to Setup. (Later Setup Value Program) 2. If auto-configuration is enabled, programmed the chipset with pre-defined values
41	Initialize floppy disk drive controller
42	Initialize Hard drive controller
43	If it is a PnP BIOS, initialize serial & parallel ports
44	Reserved.
45	Initialize math coprocessor
46-4D	Reserved.
4E	If there is any error detected, such as video, kb, show all the error messages on the screen & wait for user to press <F1> key
4F	1. If password is needed, ask for password 2. Clear the Energy Star Logo (Green BIOS only)
50	write all CMOS values currently in the BIOS stack area back into the CMOS
51	Reserved.

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POST(hex)	DESCRIPTION
52	Initialize all ISA ROMs 2 Enter PCI initializations (PCI BIOS only) -assign IRQ to PCI devices -initialize all PCI ROMs 3 PnP Initializations (PnP BIOS only) -assign I/O, Memory, IRQ & DMA to PnP ISA devices -initialize all PnP ISA ROMs 4 Program shadows RAM according to Setup settings 5 Program parity according to Setup setting 6 Power Management Initialization -Enable/Disable global PM -APM interface initialization
53	If it is NOT a PnP BIOS, initialize serial & parallel ports 2 Initialize time value in BIOS data area by translate the RTC time value into a timer tick value
60	Setup Virus Protection (Boot Sector Protection) functionality according to Setup setting
61	1 Try to turn on Level 2 cache Note: if L2 cache is already turned on in POST 3D, this part will be skipped. 2 Set the boot up speed according to Setup setting 3 Last chance for Chipset initialization 4 Last chance for Power Management initialization (Green BIOS only) 5 Show the system configuration table
62	Setup daylight saving according to Setup value 2 Program the NUM Lock, typematic rate & typematic speed according to Setup setting
63	If there is any changes in the hardware configuration, update the ESCD information (PnP BIOS only) 2 Clear memory that have been used 3 Boot system via INT 19H
FF	System Booting. This means that the BIOS already pass the control right to the operating system.

Unexpected Errors:

POST(hex)	DESCRIPTION
B0	If interrupt occurs in protected mode
B1	Unclaimed NMI occurs

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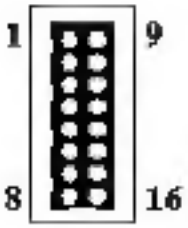
APPENDIX B: I/O CONNECTORS

J1: PS/2 MOUSE CONNECTOR:

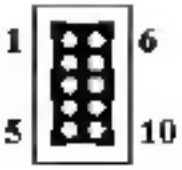
1. DATA
2. CLK
3. GND
4. NC
5. VCC

CN1: USB CONNECTOR:



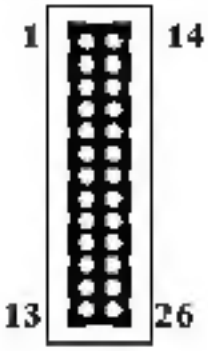
Signal Name	Pin	Pin	Signal Name
USB_VCC	1	9	Ground
USB_data0-	2	10	Ground
USB_data0+	3	11	Ground
Ground	4	12	Ground
USB_VCC	5	13	Ground
USB_data1-	6	14	Ground
USB_data1+	7	25	Ground
Ground	8	26	Ground

COM1,COM2 : Serial Ports Connector



Signal Name	Pin	Pin	Signal Name
DCD	1	6	DSR
SIN	2	7	RTS
SOUT	3	8	CTS
DTR	4	9	RI
GND	5	10	N.C

LPT1 : Parallel Port Connector



Signal Name	Pin	Pin	Signal Name
STROBE-	1	14	AUTO FEED-
Data Bit 0	2	15	ERROR-
Data Bit 1	3	16	INIT-
Data Bit 2	4	17	SLCT IN-
Data Bit 3	5	18	Ground
Data Bit 4	6	19	Ground
Data Bit 5	7	20	Ground
Data Bit 6	8	21	Ground
Data Bit 7	9	22	Ground
ACI-	10	23	Ground
BUSY	11	24	Ground
PE	12	25	Ground
SLCT	13	26	N.C.

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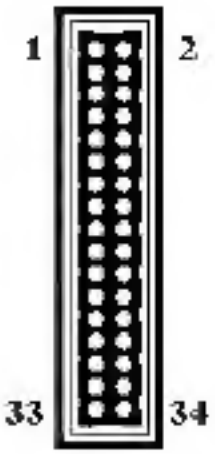
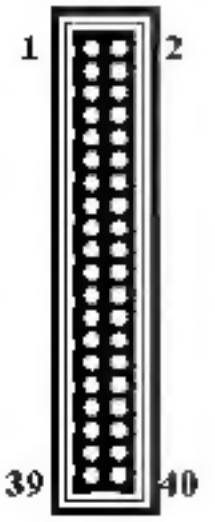
FDD1 : Floppy Disk Connector



Signal Name	Pin	Pin	Signal Name
Ground	1	2	FDHDIN
Ground	3	4	Reserved
Ground	5	6	FDEDIN
Ground	7	8	Index-
Ground	9	10	Motor Enable
Ground	11	12	Drive Select B-
Ground	13	14	Drive Select A-
Ground	15	16	Motor Enable
Ground	17	18	DIR-
Ground	19	20	STEP-
Ground	21	22	Write Data
Ground	23	24	Write Gate
Ground	25	26	Track 00-
Ground	27	28	Write Protect-
Ground	29	30	Read Data-
Ground	31	32	SIDE 1 SELECT-
Ground	33	34	Diskette

IDE1,IDE2 : Primary, Secondray IDE Connector



Signal Name	Pin	Pin	Signal Name
Reset IDE	1	2	Ground
Host Data 7	3	4	Host Data 8
Host Data 6	5	6	Host Data 9
Host Data 5	7	8	Host Data 10
Host Data 4	9	10	Host Data 11
Host Data 3	11	12	Host Data 12
Host Data 2	13	14	Host Data 13
Host Data 1	15	16	Host Data 14
Host Data 0	17	18	Host Data 15
Ground	19	20	Key
DRQ3	21	22	Ground
I/O Write-	23	24	Ground
I/O Read-	25	26	Ground
IOCHRDY	27	28	BALE
DACK3-	29	30	Ground
IRQ14	31	32	IOCS16-
Addr 1	33	34	Ground
Addr 0	35	32	Addr 2
Chip Select 0-	37	38	Chip Select 1-
Activity	39	40	Ground

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Appendix C : AGP Driver for Windows 95 Installation Guide

This section provides the information for installation of EP-58VP3A VxD Driver which supports Accelerated Graphics Port (AGP) functionalities

SYSTEM REQUIREMENTS

1.Microsoft Windows 95 OSR2.1 (OSR2.0 with USB upgrade)
2.VIA Apollo VP3 AGP Driver (Vgart VXD)
3.AGP VGA Card with Driver
4.DirectX5 DDk or SDK

INSTALLATION PROCEDURE

Step 1. Install Windows 95 4.00.950 B or later version
Step 2. Install USBSUPP (USB upgrade)
Step 3. Install Apollo VP3 AGP Driver
-run the program "SETUP.EXE" which can be found in the VIA VxD driver disk and this process will then automatically install the VIA VxD driver onto your windows 95 system.
Step 4. Install VGA driver for Windows 95
Step 5. Install Microsoft DirectX5 DDK or SDK

NOTES

1. This driver should be installed on a system with the VIA AGP chipset, VT82C597 or later, while other chipsets is not be supported. The VIA VxD Driver is only supported by Windows 95 OSR2.0 (4.00.950 B) or later versions.
2. For Win95 users, you will need to
   a. Get "USBSUPP.EXE" from Microsoft (www.microsoft.com), which includes the USB supplement and a new memory manager (VMM32.VxD) needed for the AGP DIME (Direct Memory Execute) feature.
   b. Get DirectX 5.0 from Microsoft (www.microsoft.com). DirectX 5.0 is the first DirectX version that supports AGP's DIME.
   c. Get "VIAGART.VXD", a virtual device manager which is usually installed during the installation procedure of the Windows 95 card driver.
3. To make sure if the Apollo VP3 AGP driver is properly installed, one must boot the Windows 95 system up and run "Regedit" and check whether the file VIAGART exists in the following path
   "HKEY_LOCAL_MACHINE\System\CurrentControlSet\Services\VxD
4. To check whether the AGP driver is able to activate, one must do the following:
   a. Activate the "Control Panel"

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b. Click on 'Direct X' then
c. Click on 'Direct Draw' and
d. Check if there are some values existing in the 'Bit' and 'overlays,' if there is, that means the AGP can be activated properly

REPLACING AN EXISTING VGA CARD WITH THE AGP VGA CARD

1. Shut down the computer and then turn off the power
2. Replace the VGA card boot up the system once again
3. Now, Update Device Driver Wizard Window will appear. This wizard will complete the installation of the Standard PCI Graphics Adapter (VGA). Click Next > to let Windows search for an updated driver

   WARING! Only click Next >. The system will hang if you click Cancel!

4. Click Finish to install the VGA driver. You will then be asked for your Windows 95 CD in order to complete the VGA driver installation. If you do not have your CD handy, direct the installation path to your \windows\system directory. Windows will prompt you to restart your windows. Chose 'NO' and install the appropriate AGP VGA Driver

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